The Colonnade in the Parc Monceau, Paris.

THE Parc Monceau has already been described in GARDEN AND FOREST,* so it is needless again to tell how it originated, or to note the general characteristics which, despite the introduction, in inappropriate situations, of an excessive multitude of bedding-plants, make it the prettiest of Parisian pleasure-grounds. We now desire simply to call attention to the picture on page 163, which shows a portion of a long, curving colonnade, shaded by trees and luxuriantly draped in Ivy, that stands on the edge of an oval basin of water. It is the most charming and individual feature of the park, and seems especially interesting when we find that it was not built in willful imitation of a ruin, but is a veritable relic of former days. It dates from the best period of the early Renaissance, though, singularly enough, its exact origin is not known. According to one tradition, it was brought from the destroyed Château de Raincy; according to another, which is more generally held, it was part of a great rotunda which Catherine de Medici commenced to build, north of the Church of St. Denis, to receive her own mausoleum and that of her husband, Henri II., and which was torn down in the beginning of the eighteenth century. In his book on "Paris in Old and Present Times," Mr. Philip Gilbert Hamerton writes: "Nothing can be more elegant than this colonnade. . . . In its present situation it seems like a remnant of antique architecture in some graceful picture by Claude, and one is grateful for the good sense that has saved it from destruction. Lalanne once made a very poetical charcoal drawing of it, which has been reproduced in the series of his charcoals. This is one example . . . of the happy combination of architecture with foliage and water. Set up in the British Museum these columns would signify comparatively little; but with graceful foliage and a mirror of water they are charming."

Some of the beautifully proportioned columns, with their delicate flutings and rich Corinthian capitals, can be more plainly seen than those which our picture presents; yet it would be hard to find more charming objects than these. No plant is more classic in its effect or in its historical associations than the Ivy, and it adapts itself as well to the stately simplicity of a piece of classic work like this as to the broad simple rugged masses of a Norman castle-wall or to the slender arches and elaborate carvings of a ruined Gothic abbey. It is a misfortune that, in the dry climate of our northern states, Ivy does not grow so well as it does even in the northern parts of Europe. But in sheltered situations, and especially in southern localities, it well repays the gardener's care. It is not so free and spreading in habit as the Virginia Creeper, yet it does not, like the so-called Japanese Ivy, cling so tightly to its supports that it becomes a close-fitting garment rather than a drapery; and over both of these it has the advantage of keeping its beautiful dark green foliage throughout the winter. Moreover, it grows as well when trailing on the ground as when climbing a wall or column, and this peculiarity is very useful when the gardener is trying, as so often is desirable, to connect an architectural feature integrally with its natural surroundings. Beautiful borders of Ivy are constant features in European pleasure-grounds, and our picture shows how such a border can serve the artistic purpose just referred to while forming a delightful object in itself. When trees instead of columns are draped with Ivy, and it is then allowed to run out over the grass, whether in a formal or a naturally luxuriant way, the effect is equally charming.

We would also call attention to the fine effect of the statue on the little island which occupies the centre of the basin. Had it been stood in a commonplace fashion in the middle of the island, it would have been much less impressive than it now is, reflected with its massive pedestal in the silent water, supported by the tree-trunks just beyond it, and backed by the low mass of shrubs. There is no one point where we have more to learn from the French than with regard to the placing of statues in the open air.

Winter Studies of the Pine Barren Flora of Lake Michigan.—I.

IT is the common practice of those who study plants in their native wilds to observe them mainly during their season of growth. A stroll in the woods in winter, or a botanical excursion when the ground is covered with snow, seems out of place and without adequate reward. But the trees and shrubs in winter, the mosses and lichens which cling to their trunks and limbs or grow beneath their shelter, and the humbler plants with evergreen or persistent leaves offer inviting subjects for study. Acquaintance with a plant is not complete till it is seen in all its phases. The evergreens may not exhibit any essential change of garb in summer and in winter, but they seem more isolated now and contrast more impressively with their deciduous-leaved neighbors. The leafless branches of the deciduous trees also show features of form and covering and teach lessons which are concealed when they are thickly clothed with foliage.

There is also a stillness in the woods in winter which is most impressive. This is due largely to the absence of animal life, and the feeling of loneliness is deepened by the plaintive murmur of the wind among the Pines. The cawing of the crow or the harsh cry of the blue-jay almost startles by its suddenness. But the sense of loneliness soon passes away, for though the currents of life in the forest-vegetation are in suspense the trees themselves are here, ready to furnish lessons and companionship.

One of the first plants to catch the eye in the Pine Barrens, where the soil has sufficient strength to bear it, is the Climbing Bitter-sweet (*Celastrus scandens*). It does well in the moist sands near the lake, holding to the small trees by its twining, rope-like stems. In the early winter its branches are spangled with fruit, the open valves of the orange-colored pod spreading out like a border and exposing the scarlet aril which covers the seeds. Few sights are gayer at this season than the bright fruit, set in a background of the sombre, leafless branches of the vine and its supporting tree. Near by is another climbing vine, the Greenbrier; its dark green, prickly stems clambering over the shrubs and contrasting with their duller hue like a line sharply drawn across them.

There are other shrubs with red or yellowish fruit often met with in the sands or beside the sloughs. Among them are four species of Rose, their stems usually red or reddish in the winter, with a hue more pronounced than in the summer. The hips of *Rosa blanda* and *R. humilis* are apt to be shriveled and dull, not so lasting as those of *R. Carolina*, which keep their form and colors, being plump and bright, and clinging profusely to the bushes in winter. In the wetter ground, where the latter grows, or along the lake-shore, clumps of *R. Engelmanni* are seen, with its oblong fruit still in good state of preservation and rivaling that of *R. Carolina* in abundance. The hips are not generally so ruddy, but have a yellowish tinge. Just before Christmas I looked for the scarlet fruit of the Winterberry (*Ilex verticellata*), but failed to find any, though it was plentiful on the bushes late in the fall. Probably the birds are responsible for their barren look, for they are fond of the berries. But it is not always thus, for the numerous clumps of Ilex by the borders of ponds will display their red berries in the winter, as the common name affirms.

Not so tempting nor so worthy of notice are the clusters of small, whitish berries of the Poison Ivy (*Rhus Toxicodendron*), a common plant in the sands, especially along the roads and cattle-paths. It is almost always the erect form of the plant, a foot or two high, which we see, or the one which runs along on the ground, sending up short branches. It retains its fruit all winter, for this may be found late in the spring, or well up to the time of flowering again. Doubtless it partakes of the poisonous properties of the plant, so that birds avoid it, for I have never seen it eaten by them. Its dun color does not make it prominent like the bright-colored fruits which allure birds, even if it is edible by them. The Stag-horn Sumach (*R. typhina*) is a more attractive shrub than its poisonous relative, and quite common by the borders of woods and in their open spaces, its crimson leaves making it one of the most brilliant features of autumn. The large thyrsoid clusters of fruit, clothed with crimson hairs, still cling to the ends of many of the stout, straggling branches, and serve to make it a conspicuous object in the winter also. The blunt, clumsy branches, dark with sooty bark and hairs, are in marked contrast with those of any neighboring shrub. In handling them one instinctively looks at his fingers to see if they have been blackened by the twigs. The buds are also curious, being deeply set in the midst of a large leaf-scar, and capped by a covering of light russet hairs, thus looking like a blunt cone surrounded by a broad, flat rim. The rudimentary leaves, buried under this copious coating of hairs, seem as if protected against arctic cold. The Fragrant Sumach (*R. canadensis*) is frequent on sandy banks and knolls. It usually occurs in patches of a limited area, but thickly covers the space it occupies. It is a dwarf shrub, but a foot or two high, and is a pretty object at any time of the year—in spring yellow with numerous flowers, in summer clothed with handsome, trifoliate leaves, interspersed with clusters of downy, red fruit; in autumn showy with richly colored foliage; grayish

* See Vol. II., December 11, 1889.

in winter and speckled with little spikes of flower-buds. These appear as the leaves fall off. They resemble small aments and will bear close inspection. They are formed of reddish brown rhomboidal buds, symmetrically arranged on the axis of the cluster. Each bud has a fringe of light-colored hairs, and a dark centre, sharply contrasting with this pale border, and looking as if set in a frame of hairs. The tiny spikes have a checkered appearance, and viewed in mass give to the plants a delicate charm.

The most common evergreen shrub is the Bearberry (*Artostaphylos Uva-ursi*), literally covering the surface of some of the sand-ridges near the lake, and abundant in places farther away. The globular berries, dark red or brown, still hang to the vines, but the varied colors of the leaves are their chief distinction. In sheltered localities some of the thick obovate or spatulate leaves remain of a shining green, but the greater part have assumed tints of brighter color. The typical colors, aside from green, are crimson, purple and vinous, and there are all gradations in the shades connecting these. The nearer leaves, near the ends of the stem and branches, are mostly of the brightest colors, especially the crimson shades. These colors often give to the ground a very gay appearance, as if covered by a carpet of variegated pattern, the splashes of color being extensively intermixed. When the stems rest upon a slope the effect is striking, or even brilliant. The stems are slender and whip-like, branching but little. They sometimes have a length of four or five feet, particularly on the slopes of ridges near the shore of the lake, where they run along the surface of the sands and attain their greatest vigor. Gathered at this season, or late in the fall, after the leaves have changed, they serve admirably for decoration. The leaves remain attached to the stems a long time in the dry heat of a house, and retain their colors well, so that they can be kept upon a wall from one season to another.

Englewood, Ill. *E. J. Hill.*

How We Renewed an Old Place.

II.—PLANTING WILLOWS AND PINES.

WHEN one has nearly half a mile of boundary to define around his four-acre lot, the question arises how it can be enclosed with the least expense and trouble, and in such a way as not to disfigure the grounds. With this problem we had now to deal.

The front upon the main street, thanks to the sociable fashion of our day, it would be quite proper to leave open, with only such screen of shrubs and trees as we should decide upon when the house was built, and the lawn properly graded. Part of it was already well hedged in with ancient bushes which straggled about, where the old house stood, in most admired disorder. But all along Winter Street, as the lane behind us is somewhat ambitiously designated, the fence was tumbling down, and the whole garden spot lay uncomfortably open to view, as well as to the cold east winds that blow across the meadow from the sea. We decided that here a row of Willows would come in admirably, as there would be plenty of rich moist soil for the young trees to root in, and with such a protection the wind-swept garden would in time be warm and secluded, while the silvery foliage would be a harmonious setting for the emerald meadow, and the sapphire stream.

This idea we carried out the week after we made our purchase. A friendly farmer neighbor, compassionating our folly in starting such an enterprise, but anxious to see what we would make out of the place, kindly offered to give us as many cuttings as we wanted, so one bright day in June he appeared upon the scene with a cart-load of Willows, a crowbar, and a hatchet, and, with a man or two to help him, before night he had cut and driven firmly into holes, easily punched by the crowbar in the soft soil, some five hundred bare stakes, every one of which in a few weeks put forth a crop of roots and leaves.

The stakes, sharpened at the end, were about three feet in length, one foot of which was driven into the ground, and firmly stamped into place. It was found better in driving them to have them set at an angle of about twenty degrees, with the tops pointing toward the south, so that the stems did not receive the full force of the midday and afternoon sun. We used the common White Willow (*Salix alba*), which abounds along swampy road-sides everywhere in New England.

These trees have all thriven well, though, owing to the marsh being salter in certain places than in others, some have grown less rapidly than their companions. The fear of the salt-water led us into the error of planting one row of trees at first inside the fence, and at some distance from it, where the presence of Clover and English Grass showed that the top soil was fresh. Subsequently, when they were well rooted, we removed them to the outside along the highway, where they now begin to make an agreeable shade, and an effective screen. The annual dumpings of sand made by the town along the edge of the road, to maintain its level which constantly tends to sink into the marsh across which it has been carefully built, seem to help the trees, which continue to send out surface-roots as the ground rises about them; and though some of them during their first seasons had a sorry time of it in dry, hot weather, they ultimately pulled through, and are no longer sources of anxiety.

The most exposed portion of the place being thus provided for, we turned our attention to the barren hill-side, which was a pretty hopeless-looking spot for trees of any kind. This elevation, some forty feet high and running back nearly 600 feet from the main street, seems to be the bank of some former water-way; at least I like to fancy that the odd terraces, which break its otherwise even slope, represent the gradual subsidence of some body of water which must once have filled the gorge, when the present meadow was an arm of the sea. Gravel and sand, mixed with moderate-sized cobble-stones, are its constituent parts, nothing like a boulder having come so far down. We have often regretted that some of the noble rocks which abound on the other side of the street, farther up the former stream, were not on our hill to form a feature in our landscape-gardening, marked as they are with the scratches which show the grinding of some primeval glacier.

Over the rough foundation of our hill a thin soil has formed itself; fairly deep on the level top where the plain begins, but constantly washed off down the sides into the swale below. It seems hardly possible that trees can ever have grown here, nor are there the smallest traces of any in or upon the soil; but here we resolved that trees should grow; and again the farmers mocked at such a wild idea, and looked forward with sombre satisfaction to our discomfiture.

But how to set about it?

To plow the surface, unless we could yoke a goat to the plow, seemed impossible, since we had just seen a man and a horse and a dump-cart roll together, in a confused but unharmed heap, from the top to the bottom, on account of an incautious step off of the level. Even if we could have plowed the ungrateful soil, of what use would it have been, since there was nothing to bring to the surface but stones? Cultivation being apparently out of the question, the trees would have to take their chance, and a wretched chance, too, for the south shore of Massachusetts Bay is subject to long and severe droughts and to several months of hot weather in the summer.

But here we were upheld by our authorities. An excellent book on forestry gave us some consoling statistics, and later, Garden and Forest was invaluable in its suggestions. We found that in reforesting hills in France and Switzerland that had been swept bare by avalanches, a north-east slope proved the most favorable exposure for the growth of young Pines, and, if we had nothing else, we had plenty of north and east, with the winds thrown in; so, if that was the sort of thing that they liked, why, bring on the Pines, and let them have all they want of it.

But by the time we got round to this job, as the farmers say, the season for spring-planting of Pines was over, and an exceptionally dry and burning summer was in full blast, and the very grass on the hill was crisped and dry. Our impatience, however, was too great to permit us to wait for another year to begin our experiment. We had read some accounts of August planting of Pines, and determined to have our little fling on the spot, and find out for ourselves whether it was a good time or not.

So we waited, as anxiously as the prophet Elijah, for the first sign of rain, and when at last the brassy heavens veiled themselves in cloud about the middle of August, we started off after trees—not the pampered darlings of a nursery, used to water and rich soil, but the hardy road-side denizens of dry pastures and sand-hills. We picked out the driest and sandiest spots to dig them in, so that if their roots discovered nothing to feed upon in their new locality, they would, from long habit, have got used to short commons, and could adapt themselves to the situation.

Before going out we had the men dig holes over the surface of the side hill with a grub-hoe, banking up the thin soil at the lower sides of the holes with sods, so as to make little dams to retain the water; in these holes we set the trees we selected, which were not over three feet high, but stocky and well rooted. When possible we took up the dirt with them, keeping their roots moist, and well shaded in the cart, and no more were brought at a time than could be set in two or three

once more the use of a trellis, and the grass was mown and raked clean of the last year's rowan.

Fierce war was made upon the Burdocks and Mint and Horse-radish that had squatted everywhere on the land; load after load of the accumulated rubbish of years was buried under the corduroy road, and hidden from view with gravel; the Pear-trees we carefully pruned and tied up, and the old Grape-trellis stiffened with new posts and lattices.

When all this was done, and it was no brief job, the place took on a civilized air truly surprising, but, like the boy's washing his face, which cost his father a thousand dollars, the felling of the first ragged old tree was an entering wedge of improvements that find no end.

The clearing up revealed unsuspected beauties and possibilities in the old place, and at the end of it we had taken an account of stock, and were aware that we had become owners of a treasure-house of enjoyments. But the charms and wealth of that old garden are "another story" which remains to be told later.

While all this spring and fall cleaning was going on, the heavy labor of grading was in progress. Teams and men were coming and going, heavy scrapers were plowing part of the little knoll down into the valley, and loads of gravel were being dumped to bring the slopes into proper form, the surface soil having been first removed to cover the future lawn. Week by week the work went on, till the very landscape changed its contours, as the removal of the crown of the knoll threw open to view, from the sidewalk, the fine sketch of green meadow and blue stream, once hidden from view by its cone.

When our much-interested critics found that we had chosen the site for our dwelling in an unexpected part of the grounds, their murmurs again reached our ears.

"Why in the world don't the doctor build up on top of the hill, where he can see everything, and be among neighbors?" sang half the chorus.

"If I had a lot of big trees like those Elms I'd get the good of 'em, and put my new house on the old cellar," echoed the antiphonal.

"Never can make anything better 'n a Shumack-bush grow in that gravel-pit," shouted they all together.

"Well, perhaps he knows what he's about," would interpose some friendly voice; "but it wouldn't be my way, anyhow. He'll find out, come to plantin', that he's got to have soil, even for a door-yard."

When it came to building the foundations, their distance from the highway seemed inordinate to most of these critics, but now and then we were reproached by the more ambitious for not leaving front enough. In fine, we came to be in full sympathy with the Old Man and His Ass of the fable; but being luckier than he in having a mind of our own, we did not end by pitching house and all into the water, as we might have been tempted to do from the multitude of counselors, in which, in spite of Solomon, there is not always wisdom.

Our firm conviction was that the hill, in spite of the commanding view toward the north, was too bleak and exposed a position to be pleasant for an all-the-year-round home; it was also too near the neighbors' lines, and too remote from orchard and garden.

On the other hand, tempting as the great Elms certainly were on a hot summer day, the lot at that end of the farm was quite too narrow for a house and stable such as we required. The knoll, though limited in area, gave us plenty of elbow-room, and from its elevation we overlooked the grassy swale on one side, with the hill for a background, and northward could view the ever-changing tints of the meadow, behind the gardens and the fruit-trees. Experience has confirmed the wisdom of our choice, and, in justice to our advisers, I will say that they now handsomely admit that, though they "didn't think much of the doctor's ch'ice, to begin with," they are now convinced that "he has got about the likeliest lot on the street."

Since publishing the first of these papers I have received various inquiries with regard to some of our experiments, which, perhaps, it would be well to begin to answer here, before going farther. One of the questions, which concerns the Willows, asks whether we are to make a hedge of them or allow them to grow up into trees. "If you allow the Willow-trees to grow up," asks my correspondent, "won't they shut off all your views; and if you don't allow them to, won't the labor and trouble of cutting them back every year be serious?"

In reply to this I would say that we do mean to let them grow into trees at their own sweet will, at least for the present. The knoll is so high, and the slope of the ground, from the foot of it to the edge of the place, so decided, that our veranda-floor is some twenty-five feet above the level where the Willows are set, so that they can grow for some years to come without becoming an annoyance. They are also quite a long distance away, as the line runs diagonally between us and the meadow. Should they ever become a serious obstruction, polling once in five years, we think, will keep them where we want them, as from our elevation we can look directly over the top of a very tall old Apple-tree which stands at the foot of the slope near the house, and a Willow in the distance will have to be quite a tree to be really troublesome. A vista cut here and there in the line will really enhance the charm of the prospect, but at present they are not more than fifteen feet high.

Another inquiry comes with regard to the preparation of the soil on the hill for the Pines.

Unfortunately, we did nothing in the way of making a bed for them beyond the process I have described. No doubt, they would have fared much better for a little feeding and more of them would have lived, but the hill was very steep and hard to get at, even with a wheelbarrow; and, besides, we had no soil to spare, for we needed everything we could get for the lawn and did not care to buy any for so doubtful an enterprise. We, therefore, tried our experiment under the sternest conditions. However, those tiny Pilgrim Fathers of the future forest stood the trial like little men. Some of them, it is true, died of consumption, and some of fever; but the survivors are growing tall and stout on their poor pickings and will do us credit yet.

There is one of them, nicknamed Episcopus, from its birthplace in the church lot, which is a beautiful illustration of that fable called Nature and Education, in "Evenings at Home," a book which was the delight of the childhood of a previous generation and an infinite bore to the present advanced infant.

I spied the poor thing one day hanging by one root to the side of a sand-hill, which was being graded to a smooth slope, and asked the men who were working there to let me have it. Though much ridiculed for its shapeless and unpromising aspect, it was given a comfortable shelf pretty well down on the slope and coaxed to hold its head up by various devices. Unused to kind treatment, this wayside waif, which had got used to growing nearly upside down, hung its head and sidled up against the hill, and seemed to find its branches as much in its way as the legs and arms of a guttersnipe in a parlor; but time and training and the neighborhood of Boston have their influence even on a Pine, and that clerical tree is now a very Bishop in erectness and dignity, having been lopped and pruned and tied to stakes till it puts the most symmetrical of the other Pines to shame by the vigor of its development, proving that if anything can "beat Nature" it is Education.

The consolation of a limited number of trees is that each one acquires an individuality, and their owner gets to know them as a shepherd does his flock. I wish every one could learn the way in which these little growing things take hold of one's interest, and people life in the country.

The forester of ever so minute a wood has a fund of enjoyment on his plantation that no unlimited order to the best of landscape-gardeners can ever give him. It is a fine spiritual exercise to bring the mind into sympathy with inferior organisms, and when one has fairly learned to love anything so stubborn and irresponsive as a tree, he has gained a step in mental development, even beyond that point won by a sympathetic understanding of his brother man.

However fond one may be of a flower-garden, I doubt if it ever yields quite so sturdy a satisfaction as the culture of trees. It is the difference between bringing up a girl and a boy—one all light, color, sweetness, a thing to be cherished and tenderly sheltered and nurtured; the other less outwardly winning, more obstinate in development, more independent and manly in habit, but more worth while; of positive pecuniary value when well grown; and formed, when symmetry and breadth are fully attained, to be of service in sheltering the weak and weary who seek protection in what Mrs. Gamp would call "this wale."

Hingham, Mass. *M. C. Robbins.*

Winter Studies of the Pine Barren Flora of Lake Michigan.—II.

IN some of the sphagnous bogs, or in the shallow water of sloughs on which the Peat Mosses encroach, we shall come on another shrub of the Heath family, *Cassandra calyculata*. Wherever found it grows in the greatest profusion. It is not quite an evergreen, but its oblong leaves are very persistent, and of a thick texture, giving it its common name, Leather-leaf. They fade to a yellowish or straw-colored hue in the winter, though some are purple or purple-tinged. The numerous ascending leaves are closely appressed to the stem at this season. This exposes their scurfy lower surfaces, cov-

ered with brown scales, an interesting feature of epidermal structure when examined by a magnifier, and a pretty object for an opaque mount. The stems of the Leather-leaf are about two feet high, and end in slender tips clothed with small leaves. These bear the flowers in the early spring, for it is one of the earliest to bloom. They are also peculiar in bending away from the axial line of the stem with a moderate curve, giving a graceful turn to the extremity. The Cranberry nearly always accompanies the Leather-leaf, but is not so restricted in range or habitat. It is seen in other localities, sometimes in the wet sands, where it seems to do well, showing a natural basis for the different conditions to which it has been subjected in cultivation. The species is *Vaccinium macrocarpon*, and the berries of all the vines I have seen here are spherical. They are scarce in winter, having been picked for market, or more often for domestic use, since the areas covered are too small to make their gathering of much profit. But when seen, there are few handsomer fruits than these large red or flesh-colored berries hanging from a slender stem, and made prominent by the pale sphagnous Moss among which the delicate vines creep. They are darker-colored in the winter, and the frost takes away some of their acidity. The small glossy leaves are changed to a light purple, and, as in Cassandra, are frequently turned so as to expose their lower surface, in this case smooth and glaucous.

There are other humble evergreens, almost herbaceous in character, but with leaves capable of enduring the cold of winter. They are mostly *Ericaceæ*, and are visible when the ground is bare. One of these is the Prince's Pine (*Chimaphila umbellata*). Its thick and glossy leaves, clustered on the short stems so as to form a kind of rosette, are as green and shining as in the summer. Very rarely I have found the other member of the genus, *C. maculata*, in the shade of Pines and Cedars. Its leaves, mottled with white blotches, do not shine like those of the other kind, but furnish it with one of its chief characteristics. The Checkerberry, or, as it is better known with us, the Wintergreen (*Gaultheria procumbens*), is abundant in suitable locations, generally in the shade or where the sand is damp. The leaves on some of the stems are green and glossy, but on many they have changed to a dark or vinous purple, so that a patch of these plants is quite variegated, but not as much so as in the case of the Bearberry. They are often furnished with scarlet berries, only partially hidden by the leaves, which adds to their variety and gives them prominence for fruit as well as leaves. This remains upon the plants till spring, and is frequently gathered for market, rather for its bright color and pleasant, spicy taste and aromatic flavor than as an article of food. Similar to the Wintergreen as to its scarlet berries, but quite different otherwise, is the Partridge-berry (*Mitchella repens*). This small trailing or prostrate vine, but a few inches long, is rare in the Pine-woods, growing sparingly on the richer shaded knolls, or creeping beneath the evergreens, where the soil is most productive. I find it oftener in this vicinity in the hard-wood forests, with a soil of clay or loam, in which it commonly takes the drier knolls as a place of growth. The leaves are green and shining, small, roundish and opposite. Its curious double drupes, of a sweet and pleasant taste, stay upon the vines a long time if they escape the notice of birds, and when in flower in June the fruit of the preceding year may be obtained.

Several kinds of Pyrola will be found when the ground is free from snow. As in Chimaphila the leaves are clustered near the ground, from the midst of which they send up a flower-stem in summer. The leaves are mostly oval or roundish, and often large for the size of the plant. *P. rotundifolia* has shining, coriaceous leaves, round or broadly oval; *P. elliptica* thinner and more delicate leaves, more elliptical in outline. But the two species are very closely allied, and appear to run together in their leaf-characteristics, both as to shape and texture, so that it is sometimes difficult to identify the species, the specific names not being diagnostic in this respect. Both species are common. *P. chlorantha* is much rarer, its small round leaves, rather thick and dull, so well characterizing it as to make it easy to determine in the winter-time. So of *P. secunda*, well marked by its thin, ovate, finely serrate leaves, more scattered on the low stems, and but little shining. Though met with more frequently than the last, it is somewhat rare. Both of these are more delicate plants, and with smaller leaves, than the two first mentioned. The conditions of growth of all are essentially alike, though *P. secunda* may affect drier situations, and *P. rotundifolia* those more damp than are habitual to the rest.

Another small plant with very bright fruit is seen now and then, the Dwarf Cornel, or Bunchberry (*Cornus Canadensis*). Its compact bunch of red berries, at the top of the low stems, is very prominent, and, since there are no leaves to hide it, the ground is fairly red where they grow in beds. It falls an easy prey to birds, which are very fond of the sweet and palatable berries. One more pretty evergreen vine sometimes delights the eye when a spot thickly covered with the slender, trailing stems of *Linnæa borealis*, the Twin-flower, is found. It grows in the dense shade of evergreens, and the tangled and matted stems, with small, roundish leaves, almost carpet the ground, and afford the botanist in themselves and their associations one of his choicest plants. This and the Dwarf Cornel, together with the stemless Lady's-slipper (*Cypripedium acaule*), when all are found in the cool, damp woods in blossom about the same time in early summer, bring to mind more vividly than any other plants in the barrens scenes from woods farther north. The places where they grow with the surrounding Cedars and Pines seem like spots taken from the foot of Lake Michigan and transferred to its head.

Englewood, Ill. *E. J. Hill.*

New or Little Known Plants.

Aster Tartaricus.

THERE is more pleasure to be had in the open air in North America in the autumn than at any other season of the year. It is the time of all others here to enjoy the garden and the woods, and we should lose no opportunity to increase the number of plants which are at their best at that season, and which can be successfully grown in our climate. There are many plants which are more beautiful in the autumn than at other times on account of the colors their leaves assume toward the end of the year, but there are not a great many which bloom in the autumn in comparison with the number which expand their flowers in spring or in early summer. Thanks, however, to Asters and Golden-rods the list is a fairly long one, and the flowers with which these plants enliven the autumn landscape are not without variety of form and of color.

It is desirable that they should be better known and their value for the garden appreciated more fully than it is now, in this country at least; and with this end in view we have already published figures of some of the handsomest and most distinct American species. The illustration in the present issue (p. 197) represents the end of a branch of one of the few Old World Asters known in gardens. It is an Asiatic species, and excels all the American Asters in the height to which it grows, in robustness and in the great size of the lower leaves, sometimes more than two feet long, and like the leaves of some great Silphium or Inula. The leafy stems, which are not developed until the end of summer or the beginning of autumn, shoot up rapidly sometimes, if the plant is well fed, to a height of six or seven feet, and then branching produce at the ends of the branches, which form immense, long, rather loose panicles, large, bright-colored, blue or purplish blue flowers. These do not open until the end of October or early November, or not until the flowers of all but two or three of our American Asters have passed; and if the season is favorable they continue to open until almost the end of November. A sheltered position must be selected, however, if flowers from the open ground are expected anywhere in the north after the middle of November, except in years when the coming of winter is exceptionally delayed.

Aster Tartaricus is blessed with a good constitution and a rapacious appetite; and it needs strong feeding and a deep soil into which to send down its long, stout roots; and, like most perennial plants, it gives the best results when the great clumps it soon spreads into are occasionally lifted, divided and reset in fresh soil. Treated in this way, this really noble plant will not fail to do justice to itself and to delight the owner of the garden who is fortunate to possess it, and his friends.

Aster Tartaricus is one of the best hardy herbaceous plants for supplying cut flowers for large decorations at the time of the year cut flowers are most difficult to obtain.

A mere inspection of these names seems to make clear what has been stated, that not only were they not derived from any European name or description of sugar, but that, whatever may be the difference in the dialects or language of different tribes, they all agree in referring sugar to the Maple-tree, and to the flow or rain of sap which runs from it so freely in the spring. And when we estimate the natural force and internal pressure of the sap when most active in trees, the suggestion that the idea of pressure exerted to express the sap applies better to the Sugar-cane than to the Maple, loses all its force. It is true that more extended information as to Indian names for the Maple and for sugar is desirable, and it is to be hoped that the investigation of them will be pursued through all the languages of the tribes within the habitat of the Sugar Maple. But whether it takes place sooner or later only one result can be anticipated.

The historical facts adduced show maple-sugar to be a product we owe either to the Indian or to the French. But the French, whether clergy or laity, always in their writings treat the sap and the sugar as novelties to be explained to their correspondents; and no claim on the part of the French to its introduction by them has yet been found. On the contrary, both the cleric Lafitau and Bossu the chevalier explicitly agree, though writing at different periods, in ascribing its origin to the Indians themselves—a conclusion which it is difficult, if not impossible, to avoid.

The linguistic evidence, so far as brought out, is remarkably consistent, and points with equal directness and force to the same conclusion.

As the evidence of history and of language thus combine to support the same proposition, it seems only reasonable to accept their decision, that it is, after all, to the Indian that we are indebted for the important and national product of maple-sugar.

Providence, R. I. *William D. Ely.*

Winter Studies of the Pine Barren Flora of Lake Michigan.—III.

THE Huckleberry and the Blueberries are objects of interest in their winter appearance. Four species, representing two genera, are found here. All have reddish or purple branches, whatever may be the color of the bark in summer. The Black Huckleberry (*Gaylussacia resinosa*) often looks rusty, even to the smaller twigs, imparting to the shrub, as a whole, a sombre look. It branches freely, with an irregular, straggling spray. Many of the twigs are red or reddish, and the small buds on them of a brighter red. It averages about two feet in height, but attains three or four feet in damper and richer soils, equaling smaller stems of *Vaccinium corymbosum*, near which it may be growing. It is very abundant on the sand-ridges, especially where they are open, and the Pines have given way to the Oaks. The Low Blueberry (*Vaccinium vacillans*) grows along with it, and is about as common. It is not quite as tall, averaging a foot and a half, and is a prettier plant in its winter garb. The main stem has a smooth, light-gray bark, frequently greenish above, crossed and checked with fine cracks, forming a mesh of dark lines. The branches are short and spur-like, somewhat regularly arranged around the stems. They start out horizontally, but soon curve upward. The fresh-grown twigs and smaller parts of the branches are usually pale red or pink, and contrast very clearly in color with the body of the plant. Such branches, as well as those of Gaylussacia, look as if they had been dipped to a certain depth in a red dye, the line of division between the red and the gray bark being abrupt and sharply drawn. The bud-scales are of a darker red than the twigs, and the buds near their ends prominent. In the Dwarf Blueberry (*V. Pennsylvanicum*) the whole plant is reddish purple, or the lower part of the stem may be green and the top colored. Its height is about a foot; the branches are irregular and ascending, making an acute angle with the stem, and the buds are quite large, with scales bright-colored like the bark. The Dwarf Blueberry generally grows in damper places than the two just mentioned, fringing the open places occupied by sloughs or wet ground, taking the border-land between the wet and the dry, where it thrives best. But the three grow together in many localities, and, though no close lines of habitat can be drawn, they prefer those mentioned, and are about equally abundant. The largest of the Vacciniums, *V. corymbosum*, the Swamp Blueberry, is of limited range, being found on the borders of a few of the ponds and Cranberry-marshes. The canes are from three to seven or eight feet high, the thickest of them barely an inch in diameter, the shrub being considerably smaller than those found in the Tamarack swamps, which are its more usual habitat. The grayish, flaky, outer bark of the older stems is easily detached, coming off in spots and exposing the brown inner bark, giving them a mottled look when this occurs. The new shoots and twigs are red, the longest of them straight and brier-like, though with a bark more shining than that of the Dogwoods, in this respect resembling some of the Willows. The bark of this fresh growth is slightly roughened by countless specks of a lighter color, appearing like minute blisters, and contributing a pretty feature to the comely shoots.

With the Dwarf Blueberry, but oftener in wetter ground, will be seen the purple stems of the Running Blackberry (*Rubus hispidus*). They are very slender, and clothed with an abundance of weak, reflexed prickles. The leaves are quite persistent, becoming dark purple in autumn, and clinging to the vines in winter. Sometimes, when the winter is mild, the leaves of the Strawberry persist, turning purple like those of the Running Blackberry, and appear quite fresh when in sheltered spots where they are partly covered by fallen leaves, or protected by the branches of some low-growing Pine.

Englewood, Ill. *E. J. Hill.*

New or Little Known Plants.

Encephalartos Frederici Guilielmi.

THIS remarkable and extremely ornamental Cycad was introduced into England in 1877, when stems of it were forwarded from Grahamstown to Kew as "a new species of Encephalartos, with fronds like those of *Cycas revoluta*, the crown of the stem clothed with wool to the thickness of about an inch." The specimen represented in the illustration on page 209 was one of these. Soon after its arrival it developed a whorl of female cones, each about nine inches long, which, however, had to be removed to save the life of the plant. So far as I know, it has not attempted to flower since. It is now a handsome specimen, the stem being five feet in circumference, nearly three feet high, crowned with one hundred and seven leaves, each three feet long, rigid and spineless. The pinnæ are narrow, set closely together, conduplicate, gray-green and spine-tipped. A whorl of new leaves is produced every year, the last whorl consisting of no less than thirty-four full-sized leaves. The diameter of the head is seven and a half feet.

There are about a dozen species of Encephalartos, all natives of tropical and southern Africa. They are all represented by living examples at Kew, where many of the specimens are of very large size. *E. caffer*, *E. Altensteinii* and *E. horridus* are veritable giants in the Palm house, the conditions in which appear to be peculiarly suitable to this genus. *E. brachyphyllus* and *E. Ghillinckii*, both natives of the same region as *E. Frederici Guilielmi*, namely, Kaffraria, and both near allies of that species, may be grown in an ordinary greenhouse if kept a little dry in winter. All the other kinds are happiest in a sunny stove.

The cones of some of them are very ornamental, the female cones of *E. villosus*, another south African species, being, when ripe, at least twice as large as the largest pine-apple, the color of the large, fleshy scales being rich, orange-yellow, that of the nut, like fruits half-hidden beneath them, a brilliant scarlet. In the woods along Buffalo River, near King William's Town, this species is as plentiful, and produces a somewhat similar effect to that of the male fern in the woods of England. The fruits, if allowed to remain till they ripen, are destroyed or greedily eaten by the monkeys and large birds, but in the vicinity of towns they are favorite ornaments with the colonists, who cut the cones in their green state and take them home to ripen.

Some of the species produce very large cones, as, for instance, *E. Altensteinii*, recently figured in the *Botanical Magazine* (t. 7162). This has a female cone eighteen inches long by thirty inches in circumference, the fleshy scales packed closely together, and orange-yellow in color. A male plant at Kew developed two cones last year. Sir Joseph Hooker mentions a huge specimen of this species which was seen by a Mr. Sanderson "in a secluded valley in Natal, about thirty miles from the sea, the trunk of which measured sixteen feet before branching, and twenty-five to the crown, which was formed of five branches."

For large conservatories these plants have a special value, being bold and handsome, the fronds exceedingly durable and not easily injured, whilst they are so robust in constitution that it takes a considerable amount of bad treatment to affect their health. In the southern states of America most of them

There are Lilacs, purple, white and Persian, in profusion, and the Mock Orange and Spiræas, all have their turn as the seasons go round. One White Lilac has shot up to the height of a two-story house, and now that the windows are no longer there to help one to gather them, it shows, when in bloom, a crown of inaccessible blossoms; others yield their wealth of flowers nearer at hand, and by the well, a Persian Lilac drops like a fountain with rosy jets.

No longer supported by the fallen house, a Trumpet Creeper, which trailed along the ground, has been clipped into a compact bush. A venerable Althæa, which we did our best to save, blossomed feebly for a season or two and then perished, deprived of the accustomed shelter of the porch, but great bushes of the old-fashioned White Rose abound, and there, too, is the sweet Blush Rose, beloved of the bee and the sturdy Hessian. A large Damask Rose still flourishes under the Lilacs, and a luxuriant Baltimore Belle climbs in reckless profusion over its confining wires. Where the fence stood is a low cluster of bushes covered in summer with a bold Red Rose, single and splendid, the remote parent, perhaps, of the Jacqueminot; they call it here the Russian Rose, but I do not know what its real name may be; and down in the orchard I found a bush of the dear, thorny, little Scotch Rose, the smell of which is laden, as is no other, with the memories of childhood.

There are clumps of Tiger Lilies and old-fashioned small Bluebells and Sweet Williams, and a Barberry-bush swings its yellow blossoms and red berries over the rear wall, and under the Box-arbor I found Spiderwort growing in great clusters.

One day, while strolling down along the orchard fence, a familiar odor, heavy and sweet, led me on to where a wild Azalea was hanging out its fragrant blossoms. I do not see why a hedge of these might not do well in this moist soil. I hailed this one with delight as a fine ornament to the place.

But what we like best is the fine old Box arbor, which has grown up from a garden border until its stout trees are now six inches in diameter, and nearly ten feet high, which shows their great age. They were fair-sized bushes when old men of this town were boys, and to make even a bush of a Box-plant is slow work. Here, shaded by a young Elm which has sprung up in the kindly shelter of these twisted old trunks, we sit and look out upon the meadow and the growing plants, and feel linked with the past by this memento of those who loved this garden spot, and toiled to make it fair and fruitful, even as we, too, toil to restore its beauty and productiveness.

Hingham, Mass. *M. C. Robbins.*

Winter Studies of the Pine Barren Flora of Lake Michigan.—IV.

In peat swamps, and also in wet sands, the Pitcher Plant (*Sarracenia purpurea*) may be studied. The leaves are mostly purple or wine-colored, striped sometimes with brighter lines. A nest of these leaves, resting on the Sphagnum, or among Cranberry-vines, is an attractive sight, aside from the interest which their singular form excites. Every curve and swelling of the vasiform leaf and of the hood is perfect, in harmony with the flowing lines of beauty, and the eye lingers on a beautiful shape. In winter they are mostly filled to the brim with water or with ice. When the latter is the case, by removing the integument a complete model of the cavity is obtained in ice. The water is limpid and the ice clear, except at the bottom of the cavity where objects that have fallen in have settled. The repeated freezing and thawing to which the pitchers are subjected by change of temperature does not harm them, for the tissues are not torn, and they are ready to resume their function of catching insects in the spring, and continue till the plant is supplied with a new growth of leaves.

The nest-like clumps of the Prickly Pears (*Opuntia Rafinesquii*) are very different in appearance and habitat, finding a congenial soil in the dry sands where they grow abundantly. The mixed character of our flora is well displayed by this and the Pitcher Plant, for the latter may be seen in the wet sand, and a few feet away the Prickly Pears and the Bearberry may be found growing. As the only representative of the Cactus family it is an object of special interest to the student of this flora. The winter aspect of the plants will at once be noticed. During the warm weather the joints of the stem are green and plump, and the skin quite smooth, except on some of the oldest, and the stems are somewhat ascending, and some of the joints upright; in the cold season, though retaining their green color, they are much wrinkled, the skin wavy, and the joints are limp, lying flat upon the ground as if to expose as little of their surface as possible. The stiff tissues have become very pliable, and the stems, if lifted up, fall back like a weak or lifeless body. When partly buried in sand, or covered with dead leaves, which their irregular shape and spines well adapt them to catch and hold, they retain more of their summer habits and position. Their spines are sometimes rather formidable, though not present on all plants, or so greatly developed, except upon a few, where they become an inch to an inch and a half long, and stout in proportion.

Several of the herbaceous plants have not lost all their seeds, though the stems are dead. The cottony heads of Anemones, especially those of *Anemone cylindrica*, attract attention. They are swollen to an oblong bunch by reason of the loosened akenes, and the down is rusty-looking. The faded stems abide stiffly in their places, and contribute their part in giving variety to the scene. The pale pappus of the Golden-rods and Asters, and the hairy spikes of the Beard-grass (Ardropogon), still remain in quantities sufficient to remind one of the spots where they were common in summer; and when the ground is mantled with snow, and flocks of snow-birds and snow-buntings appear, such plants as these, rising above it, are a welcome source of food to these birds, lighting on the stalks to gather the seeds or skipping over the surface of the snow to pick up those which have been scattered by the wind.

Those interested in Mosses and Lichens will find many of these forms of plant-life in as good a state to investigate as in the summer. Dr. Henry Muehlenberg, a careful and diligent botanist in the days of firesides and back-logs, resorted to his wood pile for material of this kind in the winter-time, and considered it the best season for their study. Under date of January 18, 1811, he writes to his friend, Dr. Baldwin: "For Mosses, the present season is best. They are best distinguished when the operculum is ready to fall and the peristoma beginning to show itself. The Lichens we can often find at the fireside, and I have gathered a good number just before I put the wood in the stove or on the fire" (Darlington's "Reliquiæ Baldwinianæ," p. 26). But to enjoy such plants and discern their beauties, to learn some of the lessons they may teach, it is not necessary to be a bryologist or lichenologist, or be called by any such hard names, or even be skilled in the use of the compound microscope, though this instrument is indispensable if one would go very far.

The Reindeer Mosses (*Cladonia rangiferina* and allied species) here take to the sand as readily as in rocky regions they do to the rocks. The shapely clumps, usually circular in outline and with a rounded surface, resting on the bare ground, the dichotomous branching of the stems, their varied colors, pale, ashy-gray, greenish-gray, yellowish, pink and flesh-color, all please by their variety. The trunks and limbs of many of the Pines are spotted or nearly covered with the flat expansion of other Lichens, varying in shades of color, but mostly those of gray. These colors are too subdued for brightness, but harmonize well with the dark-colored bark of the Gray Pine, there being enough of contrast for good definition, and the boll of the tree, however small, when provided with the Lichens, takes on the appearance of age. Species of Usnea, with long, glaucescent stems depending from the limbs of trees, are not common as they are farther north, where they hang from the limbs in such quantities as to make the bearded trees, look venerable.

Several of the common mosses are quite noticeable in winter. In patches on the sand are the light green, or the yellowish green tufts of one of the most abundant kinds, *Ceratodon purpureus*. The cushiony tufts vary in size and shape, being as small as a coin to a foot or more across, and round, oval or irregular in shape. The fruiting-stems have already started, and in early spring the bunches will be bright with purple stems and capsules. Much like them are the tufts of Bryum, but with stems less condensed. In marked contrast with these, both for stoutness and color, are the stems of the White Moss (Leucobryum). The compact tussocks are almost white, or white tinged with green, and are very pale, spread out at the base of some sheltering tree, the soft cushions are very inviting as a place of rest in summer, but, if tried, may be found as fully saturated with water as the stems of the better-known Sphagnum, able to absorb seven or eight times their weight of water. Wherever they are, these cellular Mosses aid the trees under whose shade they grow, by helping to retain the moisture near their roots, and enriching the soil with humus when the stems decay, and thus find their rôle in the economy of nature. Large reaches in the damper grounds are carpeted with the Hair-cap Moss (*Polytrichum commune*). Its sharp, slender leaves, resembling those of the Juniper, have an evergreen look. The stems are tall for a Moss, sometimes nearly a foot in height, and in walking through the soft beds one sinks into them ankle-deep. Another pretty moss growing in loose patches of considerable extent in the partial shade

of trees is worthy of notice for the effect its peculiar coloration has on the sandy ground. It is the *Thelia Leseurii*, of Sullivant. The round and closely leaved stems are barely an inch high, and of a glaucous-green hue, contrasting well with the surrounding sands. The leaves are beautiful objects when examined under a low power of the microscope, being thickly studded with lobed or star-shaped papillæ, which seem to affect the light they reflect, and contribute to the charm they have when seen in masses. I find this Moss nowhere except in the dry sands. It is assigned a range in our literature on Mosses from New Jersey south along the Atlantic, and in the southern states, but is not uncommon in the Pine Barrens here.

Englewood, Chicago. *E. J. Hill.*

New or Little Known Plants.

Clematis connata.

NO figure has yet appeared apparently of this handsome Indian Clematis, which produced flowers at the Arnold Arboretum at the end of October of last year, from a plant sent here three years before from the Royal Gardens at Kew under the name of *Clematis Japonica.*

Clematis connata * (see p. 235) is a stout woody climber, with ample long-petioled leaves composed of three to five remote leaflets, which are three or four inches long, broadly ovate, cordate by a broad deep sinus, coarsely and irregularly serrate, or sometimes slightly three-lobed and borne on stout petiolules one and a half to two inches long ; they are dark green on the two surfaces, with five principal veins and prominent reticulated veinlets. The flowers are produced in many-flowered panicles, and are campanulate, an inch long, and clear light yellow in color. The sepals are oblong, acute at the apex, pubescent on the outer and tomentose on the inner surface, and reflexed above the middle when the flower is expanded. The filaments are linear, and are coated with long silky light hairs. The fruit, which has not been produced here, is described as "silky pubescent."

Clematis connata is a native of the temperate Himalayas from Hazara to Sikkim, at elevations varying from 4,000 to 10,000 feet above the sea-level. The stems suffer here in winter, and are generally killed back to the ground. This, perhaps, accounts for its flowering so late in the season (October 27th), a peculiarity which deprives this species of much value as a garden plant in New England. It is, however, a rampant-growing plant with high-climbing stems, large bold foliage and beautiful flowers ; and in regions of longer summers and warmer autumns it will doubtless prove a desirable addition to the plants of its class, certainly well worth experimenting with in some parts of the middle and southern states. *C. S. S.*

Cultural Department.

Cinerarias.

THE Cinerarias at the gardens of Dr. C. E. Weld, Brookline, Massachusetts, this spring, were probably the best, taken altogether, which have ever been seen in this country. In a late number of the *American Florist* Dr. Weld's gardener, Mr. Kenneth Finlayson, describes his method of cultivating these plants, the main portion of which we herewith reproduce :

My experience with Cinerarias, especially with those sown early, say any time in June, and for early-flowering purposes, is that they require more care than most kinds of plants to pull them through the hot months of summer. It is a well-known fact that Cinerarias are very impatient of strong sunlight, such as we get here in the months of June, July and most of August, and the prime difficulty is in providing a temperature which suits them. My method is simply to shade the glass with a thin coating of white paint, and over this, on hot, bright days, I put a lattice shading. These lattice shades are made to fit over our sash (ordinary cold frame, or six by three feet). The bars run horizontally instead of crossing each other ; they are one inch wide and a quarter of an inch thick, the space between each bar being a trifle over half an inch ; the frames on which the bars are nailed are one inch square.

These shades I consider the best of all when shade is necessary, for the reason that they are movable, in the first place, and put on when really needed, and secondly, because they keep the glass cooler than any paint or canvas shading will do, thereby giving, as near as possible, the conditions most favorable to plants needing a shade.

I further lower the temperature by raising the sash at both ends by wooden blocks, cut longer than they are wide, and wider than they are thick, so that one block will raise the sash to three different heights, as necessary.

Syringing overhead in the morning and afternoon of hot, dry days is very beneficial to the plants under consideration.

Greenfly attacks these plants at all stages of their existence, but are easily kept under by fumigation. When in frames outside I strew tobacco-stems all round the pots in which the plants are growing, and find no difficulty in keeping them clean in that way. In the greenhouse I seldom have to resort to any remedy for these pests, as they do not attack them much. To some this may seem strange, but the reason is quite plain, and nothing more or less, in my opinion, than that the Cinerarias are kept in a temperature admirably suited to them, but less congenial to the greenfly, namely, forty and forty-two degrees Fahrenheit at night.

The soil I use for the Cineraria in the early stages consists of one-half leaf-mold and one-half good turfy loam, with a liberal dash of sharp clean sand added. At each successive potting the leaf-mold is withheld partly and the loam increased proportionately. The final potting soil consists of one-fifth leaf-mold, one-fifth good rotten cow-manure, the remaining three-fifths turfy loam, very little sand, a liberal dash of fine crushed bones.

The stimulating begins when the pots in which they are to flower are well filled with roots ; cow-manure, liquid, I use frequently, but chiefly guano and soot in equal parts mixed. I put a large handful of the latter in a six-gallon can of water and stir well with a stick, to incorporate the stimulating ingredients in the water before using. I apply this dose once or twice a week, as the weather demands—that is, if the weather should be bright there is more demand on the water-pot than there would be on cloudy days, therefore the stimulating must be regulated accordingly.

I use guano alone on almost every kind of plants, and on gross feeders, like Cinerarias, Calceolarias and Chrysanthemums, I use it in stronger solutions than do most cultivators.

Odontoglossum coronarium and O. brevifolium.

GREAT confusion has always prevailed among Orchid growers in respect to these two species of Odontoglossum. From the descriptions which have from time to time appeared in horticultural journals, it is evident that but one is referred to under both names—sometimes *O. brevifolium*, sometimes *O. coronarium.* This being the season of flowering, it will not be inappropriate to point out the differences between the two species, and to show that the plant, carelessly designated under both names, is in reality the true *O. coronarium*, as described by Lindley in his "Folia Orchidacea." How the confusion arose it is difficult to say. *O. brevifolium* was discovered about ten years before *O. coronarium*, but does not seem to have been successfully grown in Europe, and it is possible that the latter species, when introduced, was, in the first place, thought to be the true *O. brevifolium*, and was launched into commerce as such.

To afford some means of distinguishing the two species, which certainly appear to be closely related, it may be as well to state that *O. brevifolium*, according to Lindley's description in "Plantæ Hartwegianæ" (1839, p. 152), has ovate oblong compressed pseudo-bulbs, surmounted by a single leaf; the leaves are two inches broad, and sometimes not much longer ; the individual flowers are an inch and a half or more in diameter, and eleven or twelve are borne on a drooping raceme, being apparently purple in color. This species was collected for the first time, with many other Orchids, by Theodor Hartweg, who was dispatched to South America, in 1836, by the Royal Horticultural Society of England, in search of new and rare plants. Dried specimens and plants were sent to England, but, beyond the botanical description recorded in "Plantæ Hartwegianæ," nothing has ever since been heard of them, except when the name has been misapplied to *O. coronarium*, which has flowered several times, and has been

*1. *Clematis connata*, De Candolle, "Prod." i., 4.—Wallich, "Cat.," 4679.—Hooker f. & Thomas, "Fl. Ind.," 11 ; "Fl. Brit. Ind.," i., 6.
C. venosa, Royle, "Ill.," 51.
C. amplexicaulis, *C. velutina*, *C. gracilis*, Edgeworth, *Trans. Linn. Soc.*, xx., 27.

ment against the assertions that are made by prudent men concerning the gradual destruction of the timber of the country.

If the trees on these scattered woodlands were allowed to grow up again the work of these portable mills would not be so much of a calamity, but, too often, when farmers find their trees cut away they endeavor to break up the land and add to the area of their cultivated fields. As a rule, too much land is already under the plow, and this new clearing simply means a few more acres of poorly tilled land and no increase of income. That is, the farm would generally yield a larger income if the wood had been allowed to stand, and if the labor and money put in the new ground had been expended upon that already under tillage. Indeed, in a great many instances it would be profitable for the farmers of the country to allow the broken, or sterile, or stony portions of their land to grow up in timber, and give more thorough culitvation to what remains. Where these mills have been operated for any considerable time one can see that the country loses much of its beauty, which is a more important matter than it seems, for a well-wooded country has attractions for city visitors and city buyers which enhance the value of real estate to an appreciable degree. But, besides this, it may be questioned whether the opening of the country to the sweep of the cold winds in winter, and drying winds in summer, does not have an appreciable effect on the general fertility of any region.

But, after all, these voracious little mills are only one other device used by this generation in its haste to get rid of its inherited forests. There is little reason to hope that any salable tree will be allowed to stand. The promise of future forests in the country seems to rest with the children, and depends upon their proper education. Who is to write the school-book which shall inspire our future citizens with an adequate appreciation of the value of forests as a natural resource, and of their functions in relation to soil and climate and health? Not the least of the benefits of early instruction of this sort would be its help toward establishing a personal friendliness for trees and toward the creation of a public sentiment which will protect them from wanton destruction at least.

Mr. John Robinson has begun, in the *Salem Gazette*, the publication of a series of articles on "Our Trees." From the first of these papers it appears that there are about 125 different trees growing naturally or cultivated in and about Salem. Of these sixty-four are natives of eastern Massachusetts and seventeen come from the other parts of the United States. Salem is, therefore, a very good centre from which to study trees, and Mr. Robinson's papers cannot fail to stimulate much interest in the subject. In the introductory article Mr. Robinson calls attention to the fact, which has often been insisted on in these columns, that people who are familiar with humbler plants, and this applies, too, to learned botanists, have a very slight acquaintance with trees. "Nearly every one," he remarks, "can tell an Elm from an Oak or a Willow from a Pine, but the difficulty seems to be in telling the Oaks and Pines apart, to distinguish the Pines from the Spruces or the Birches from the Hornbeams, or separate the many foreign trees in cultivation from the native species." "And a little observation," he tells us, "will serve to fix nearly all of these trees in mind and add much pleasure to town walks and country rambles. When a good example of some tree is found it should be carefully watched from the earliest warming up of its blood, so to speak, by the spring sun through all its various phases of bursting buds, flowers and fruit, and falling of its leaves. Methods in observation are thus acquired which can be applied to other things in life. By this out-of-door study much more satisfactory results will be obtained than by merely trusting to match flowers or fruit to description and figures. Although books are valuable aids, Nature never will confine herself to plates, which must be typical rather than universal in their scope."

A sunset, a forest, a snow-storm, a certain river-view, are more to me than many friends, and do ordinarily divide my day with my books.—*Emerson.*

Winter Studies of the Pine Barren Flora of Lake Michigan.—V.

The greater part of the woody growth found in a Pine Barren will naturally be sought among the evergreens. Five kinds of these are present, making, with the Larch, six species of conifers. These are closely associated with deciduous trees, or have been supplanted by them, for many of the Pines and Cedars have been destroyed by fire, and Oaks and Poplars have taken their place. But when protected a new growth of Pine is made, the White Pine or the Gray Pine, according to locality and conditions of the soil. Protection is difficult in a region traversed by several railroads, and must be restricted to quite limited areas. Hence, some of the problems of forestry may be advantageously studied in a section of country no larger than the one which embraces the wild lands at the head of Lake Michigan, where the trees have to struggle with the carelessness and wastefulness of men. Groves of White Pine are sometimes seen where the ground is well stocked with thrifty trees of recent growth, from ten to thirty feet high. They have sprung up in the track of fires and maintained their place, and, if not interfered with, would in time form trunks of fair dimensions. The natural conditions are present for a Pine-forest from two to four miles wide, extending from the boundary of Indiana, eastward, into the state of Michigan. Most of this is now waste land, of little use for any produce that may be obtained from it. Once there were saw-mills in the tract cutting up Pines and Whitewood (Liriodendron), found in paying quantities.

Taking the coniferæ according to their abundance, the list is headed by *Pinus Banksiana*, the Gray Pine, or Jack Pine, as it is generally called at the west. It is limited to the close vicinity of the lake, a strip of land from half a mile to two miles wide embracing about all of it. An essentially pure wood of this species is found only on a narrow strip along the shore, where scarcely any trees except a few Red and White Cedars are mixed with it. The succession of woody plants is about as follows: Next to the beach is a fringe of Necklace Poplars (*Populus monilifera*), mostly stunted trees, often bearing fruit when only eight or ten feet high. Interspersed with these are Willows and Rose-bushes, Cornels, Grape-vines and the Sand Cherry (*Prunus pumila*). Then the Gray Pine comes in, dwarfed, and often shrub-like where much exposed, but forming trees with trunks six inches to a foot and a half through when away from the shore. Though it is usually a homely tree when standing alone, groves of it, where the ground is free from underbrush and covered with an abundance of fallen leaves or with a sparse herbaceous vegetation, possess attractive features.

Flattish reaches of this Pine convert the nearly barren sands into clean shady woods, almost equaling woods of Red Pine. They do not have the straight columnar trunk of this tree, covered with smooth reddish bark, the limbs high up and forming a close canopy, with thin, long and slender needles in brush-like tufts, but a short trunk with dark-colored, rough and flaky bark, the limbs low down and the branchlets studded on all sides with short, stiff, yellowish green leaves. They are most shapely when somewhat crowded, being spire-shaped when young and small, and when well grown making a roundish crown with their spreading limbs. As a shade-tree along a sandy road, they do well and may be quite shapely. Dr. Richardson considered Bank's Pine a handsome tree when growing in favorable situations.* Isolated upon the sand-hills, where it is buffeted by the winds, it may be only a straggling shrub or scraggy tree, standing firm till the sand is swept from off its roots and it is undermined and toppled over. Even in such localities it is frequently a picturesque object, winning respect for its sturdiness, though not admiration for its shape.

The Gray Pine in this section varies in height from a shrub, fruiting when but two or three feet above the ground, to a tree sixty feet high. Trees thirty or forty feet high are common in the denser woods away from the shore of the lake. I have measured some that had a girth of sixty inches, and those with a diameter of ten to twelve inches are frequent. The trunk varies but little in size up to the first branches when these are low, and scarcely any portion of the roots is visible above the surface of the ground, from which the tree rises like a post. It may be found producing cones when but half an inch in diameter at the ground and four feet high, bearing a few short branches at the top. But the trees are usually much more stocky than this when fruiting.

The crown of this tree is generally disfigured by the dark-

* Gordon, "The Pinetum," p. 231.

colored cones adhering to the branches. They are very persistent, and last for many years. It is doubtful whether they fall off naturally, though they may be broken from the limbs or drop off when the attachment rots away. They are more durable than the smaller branches to which they cling, for on fallen trees that have lain upon the ground a long time the cones remain till the branchlets decay, the thick and indurated scales being more lasting than the wood. They are closely sessile, and when a fresh cone is pulled off some of the wood of the supporting branch invariably comes away with it, a piece from half an inch to more than an inch in length, and often reaching to the centre of a small twig in depth, being torn out. No better proof of the growth of a flower-cluster from the wood could be desired. Even the old and dry cones do this to a less degree, or the branch breaks off before the cone can be detached. This persistence of the cones gives to an old tree the appearance of great fruitfulness, the fruit of many years being represented on it, though comparatively few cones are produced in any single year, the fresh ones often being quite scattered, or even scarce, upon the limbs. Hundreds of these old cones may be counted on a dead tree, the limbs being almost black with them, or they may look gray or grayish from the cones weathering on their exposed parts to the color of the nest of a paper-wasp. The old cones usually point downward from the limbs, and become top-shaped by the spreading of the scales, their diameter nearly equaling their depth, an inch or more across.

The newly ripened cones are from one to two inches long, conical, but usually a little curved at the end. They are of a light or yellowish brown color. The scales are thick and blunt, reddish brown within when they first open. Each ends in an oblique, somewhat four-sided, or rhomboidal plate. In the centre of the plate is a shallow pit, or eye, of a grayish color, from which many fine lines radiate to the margins. There is enough variety in their colors and markings to impart a fair degree of prettiness to them at this time. As they are often in pairs, and on opposite sides of a branch, pointing in the same direction as the branch, they have the appearance of stumpy horns scattered among the leaves.

Rudimentary cones are seen upon the branches in the winter, as they form the preceding season. These are from a fourth to a half inch in length and ellipsoidal in shape. Like the winter-buds, they are often coated with resin, which exudes freely whenever the wood is cut, and is also copious at the base of the twigs and branchlets. At these points it forms balls frequently half an inch in diameter, completely investing the branches. The resin is formed in connection with the persistent remnants of bud-scabs, encircling the twigs at their insertion, and hence accumulates there in balls. There are also seen upon the branches clusters of withered aments, which, though the tree sheds its pollen in May and June, remain till the following spring.

The seeds of the Gray Pine are small and dark-colored, with a relatively large pale-brown wing, so thin as to be transparent. Hence it is very light and may be carried far by the wind. The wing, shaped almost exactly like that of some insect, is striped along its inner edge with lines of darker brown. The seeds usually occur in pairs, and are eagerly sought for food by the White-bellied Nuthatch (*Sitta Carolinensis*). Small flocks of these birds, which become gregarious in winter, are seen flying about among the trees, searching the cones for seeds or pulling off bits of the bark under which insects or larvæ may be hidden. Their long and flattened bill is nicely fitted for this work, for the seed lies close to the scale, but the wing, dexterously snipped off and dropped, as it comes floating on the air, shows that they readily succeed in their efforts.

The position of the cones upon the branches is rather upright, which tends to keep the seeds from falling out. Though the cones mature in the fall they are slow to open, and continue to open throughout the winter, some being closed even up to spring. This prolongs the season of supply for these birds, which are quite abundant, and among the few to stay with us and make the woods more cheerful in the winter. The Gray Pine takes a wide range in its conditions of growth. Naturally a denizen of rocky ground and dry sands, it is not uncommon here in the wetter grounds. I have taken it from the scanty soil lodged in the fissures of rocks in Canada, and found it here in sphagnous swamps, growing amid clumps of Cassandra, with the Pitcher-plant at its base, its roots covered with Sphagnum and Cranberry Vines. In such wet positions it is short-lived, though it may grow to a shapely little tree, three or four inches in diameter. But in some swamps less wet it takes a place beside the Tamaracks, like this tree tall and slender when the growth is crowded, with a clean trunk devoid of limbs till near the top. Groups of such trees under these conditions are rather neat and attractive, in the winter the yellowish-green of the Pine offsetting the dense, rough spray of the Tamarack; in the summer mottling its soft foliage of lively green with a well-contrasted color.

Englewood, Chicago. *E. J. Hill.*

How We Renewed an Old Place.

IX.—PLANTING TREES ON A LAWN.

THE house at Overlea was begun in the summer of 1887, and completed in April, 1888, at which time the grading of the knoll was finished, and the lawn ready for planting and sowing.

Our first experiment, however, in moving good-sized trees was made in the month of January of the latter year, when we transplanted two large Norway Maples, given to us by a friend, on condition that we would take them away at that time, as otherwise they would be destroyed by some grading that was going on where they stood.

Fortunately, it was an open winter, with no frost in the ground, and there was no difficulty about digging. I personally conducted the procession, and insisted upon having the diggers begin at the outside and work in toward the trunk, so as to save all the little roots. It was slow and careful work, and it took all day to move two trees. They were too heavy to lift with a ball of earth, as we had no special appliances for the purpose, for the largest one measured six inches through, two feet from the ground, and had a lofty top.

After the trees were carefully uprooted their tops were cut off, until the main stems were only about eight feet high, and the branches that were left running up from them were also cut back to within a few feet of their union with the trunk. Could we have foreseen the mildness of the two succeeding winters we should have been tempted to prune them less severely. I am almost sure that it was unnecessary, but moving them at such an unusual season seemed to make it wise to give them more root than top. It will take about four years for them to get back their original stature after this severe treatment, but they perhaps have escaped risks of drawbacks by the way. Similar trees in this town, transplanted without topping, though they have lived, have shown signs of feebleness, and I am disposed to think that in the end ours will make the finer specimens.

The holes in which they were set were dug six feet in diameter and nearly five feet deep, and six or seven cart-loads of loam were put in them. A gentle rain was falling when the Maples were set; and when the roots were fairly covered and the ground trodden closely about them, water was put into the holes before they were finally filled up.

These two trees, planted on the south side of a gravelly slope, so that the moisture must run away from their roots more than is desirable, have made so heavy a growth in the last two years, that in the middle of summer we have been compelled to cut out many large branches to admit light, and to improve their shape. In addition to their density of growth, they have shot up fresh stems, between seven and eight feet long, in the two seasons they have been fairly growing, for the first summer they did not accomplish much beyond a good crop of leaves. By the end of July we look to see them grow four or five feet more, as they are fairly set, and in fine healthy condition. The ground about them has been kept open and cultivated, and is heavily enriched several times in the course of the summer.

They are so near the house that we use the broad space around them as beds for Geraniums and Heliotropes, which probably detracts a little from the growth of the trees, but at the same time improves their appearance and keeps the earth moist and well stirred up about their roots. When the season is dry they are very thoroughly watered at least twice a week, by leaving the hose to run on them from its open mouth for an hour or two at a time.

In April we moved in the same manner a Silver Maple, which has grown nine feet and ten inches, and a stocky White Willow, which has been put quite near the house to give us immediate shade, of which we are greatly in need, and which is to be cut down as soon as the Maples are big enough. This last tree has grown, in a very dry place, a dense head nine feet six inches in height, so that it is now a tree seventeen feet high.

These are the best we have to show, except a Catalpa, which has made a most luxuriant growth, for our Ash-leaved Maple, which was also disposed to make a record, has been moved twice, and so set back. But this growth on a gravel-bank,

eternally upon his canvas. The tender grace of early spring, and the glowing glory of autumn are alike evanescent and wonderful expressions on this smiling meadow face. Like a dream, this hint of ineffable beauty melts away, and the impression gives place to a reality of vivid green field, and dark blue water, which will make but a pleasant inland landscape until the August sun burnishes it into ruby and gold, and makes it once more a vision for a painter.

The exquisite must perforce be evanescent, that no touch of commonness may mar its distinction.

The tender grace of a day that is dead

haunts many a spot, otherwise tame enough, with a memory and a knowledge of its capabilities, that make it forever dear and beautiful to him who has seen it under that enchanting glamour lent by a season, or an hour, which imprints upon the brain a picture that can never be forgotten. And when at other times of year I look upon this far reach of often-changing meadow, there abides with it always a memory of the soft and tender charm of early spring, that no reality of November-brown, or winter-snow can wholly drive away.

Hingham, Mass. *M. C. Robbins.*

Winter Studies of the Pine Barren Flora of Lake Michigan.—VI.

NEXT in abundance among the conifers is the White Pine (*P. Strobus*), either in moister and richer ground or mingled with the Gray Pine and Oaks upon the ridges. The trees are mostly small, none more than a couple of feet in diameter. The bright green soft and slender leaves, two to four inches long and in bundles of five, are somewhat tufted at the ends of the branches, giving to this Pine a grace too little appreciated by those in search of trees for ornamental planting. There is a feathery softness in the foliage of the White Pine which is lacking in that of the Scotch and the Austrian Pine, so often seen in parks or in private grounds. The foreign trees appear stiff and rugged beside it. The branches of the older trees are nearly horizontal, and rather slender near the end, and, when the leafage is heavy, may curve or droop a little on this account, and when moved by the wind wave to and fro with a graceful motion. But the wind generally gives them a broken, choppy motion, like a subsiding water-surface on which the storm has spent its force. This is more apparent when their tops can be looked down upon from some commanding height. For use in parks, particularly if the soil is light or sandy, this Pine is admirably adapted. I once came into a pure wood of this tree near Michigan City, Indiana, which had evidently been cared for by the proprietor. The trees were young, the trunks from six inches to a foot in diameter, and not crowded for standards of such dimensions. As a result, the limbs were lower down, and the crowns rounder and more spreading than when pressed upon by others in the thick forest. The sandy ground, well covered by fallen leaves, was completely shaded, and the cool, refreshing grove showed the possibilities of this Pine for park purposes, either when available as a natural wood or planted in harmony with its natural conditions.

Another conifer is the White Cedar, or American Arbor-vitæ (*Thuya occidentalis*). The small trees, from ten to twenty feet in height, either border the sloughs or form small groves in the moist grounds, but are nowhere abundant. Though its foliage resembles that of the Gray Pine in color, in other respects it is quite in contrast with it. This is shown by the form and arrangement of its scale-like leaves, its flat, fan-shaped spray, its numerous branches, the smaller drooping and twisted so as to point various ways, and its bole covered with light-colored shreddy bark. The Red Cedar (*Juniperus Virginiana*) is sparingly found either in company with the White Cedar, or oftener in drier ground. It is scarcely taller, the trunks being rarely more than six or eight inches through. Nearly all are beautiful trees, almost perfect spires, though somewhat grim in habit. The spray is dense, beginning near the ground, and the branches shorten so gradually as to make a conical mass of foliage. The leaves are rusty green and but slightly glossy, and in the winter change to a tanny brown and other shades, which impart to the crown a purplish hue. By means of its different tints it is readily distinguished from the White Cedars, even at a distance, and charmingly varies the effect when grouped with them, its purples and browns mingled with their light, and, in the winter, somewhat faded green. The ordinary, or more typical, leaves of the Red Cedar are blunt and scale-like, but near the ends of the more vigorously growing branches they are stiff and prickly pointed, like those of the common Juniper, though considerably smaller. The youngest trees, till they reach the height of a man, have leaves almost wholly of this character, and entire branches on older trees may be found that look as if a branch from a different species had been fastened to it. I have taken from the same tree three forms of spray—that with ordinary leaves, that with the pointed, awl-shaped leaves, and that with the two commingled.

The common Juniper (*Juniperus communis*) is often met with, especially near the shore of the lake, though clumps of it occur throughout the sand region, so that it is the most widely diffused of the conifers here. Some of the shrubs attain a large size, the prostrate limbs from three to six inches in diameter. Clumps are found more than thirty feet across in their longer diameter, their general shape being oval or circular. Those, from a single root, sometimes measure twenty-five feet, and those from ten to fifteen feet are not unusual. The color of the bushes is considerably variegated in the winter. The smaller branches are brownish or purplish near the end, the leaves changing somewhat in color. Lower down, or nearer the ground, they preserve their look of glossy green. The lower surface of the leaves shows more in the cold weather than in the summer. The spray is flattish, but the ultimate branches tend to rise into a vertical position, or twist upon their support, thus interfering with their flatness, and exposing the glaucous under sides of the leaves, so that the ends of the branches seem to be covered with hoar-frost. The appearance is so deceptive that upon a day suitable for frost actual touch may be needed to convince one of his error. This varies their color still more. The green or bluish green berries are commonly abundant, and this also gives variety to their general appearance. These do not assume their dark blue color till the season following the time of flowering, the fruit ripening the second year.

There are occasional groves of Tamarack (*Larix laricina*), or some trees may be found by the edges of sphagnous swamps. The largest areas comprise but a few acres, and on the whole the tree is scarce. It is of low stature and bushy-branched, the limbs usually coming low down upon the trunk. The recent shoots are brownish or reddish gray, but the ground color of the mass of the spray in the winter season is very dark, the bark on many limbs, either from its own decay or from some fungoid growth, being coated with a sooty substance, which may be rubbed off like a black dust. The branches are nearly horizontal, and divide into numerous short, straight and very slender branchlets, on which rest the round or cylindrical buds, often wider than the twigs themselves. The prominence of these buds when the limbs are bare of leaves gives to the spray of the Tamarack a peculiarly roughened appearance, as if covered with wart-like bodies.

Englewood, Ill. *E. J. Hill.*

Plant Notes.

Some Recent Portraits.

The June issue of the *Botanical Magazine* contains figures of the new *Lilium Henryi* (t. 7177), one of the interesting plants discovered by Dr. Augustine Henry in western China. From Dr. Henry's notes it appears that "it occurs in two situations, both near the town of Ichang, in the Hupeh province, on the grassy slopes of precipices at an altitude of 200 to 2,000 feet above the sea-level. A few specimens occur on the eastern side of the dome, a mass of conglomerate, which rises to about 1,800 feet, and which lies ten miles south of Ichang. The plant is very plentiful on the right bank of the Ichang gorge, between the villages of Ping-shan-pa and Shih-pi-shan, and on the grassy slopes of the limestone cliffs inland from the last-named village, from which the path leads up to the Taout monastery, named Yang-tai-kuan." *Lilium Henryi* flowered at Kew in August, 1889. It is a species with bright yellow flowers two or three inches long with lanceolate segments reflexing when expanded from near the base and furnished with numerous red-brown spots, and toward the base with a green keel and a few large clavate bright yellow papillæ; *Cypripedium Klotzschianum* (t. 7178), a showy species discovered in British Guiana during Sir Robert Schomburgk's second exploring expedition in that country. With regard to the affinities of this species, it is stated in Veitch's Manual of Orchidaceous Plants that, "though when not in flower, it is scarcely distinguishable from *C. caricinum*, the nearest affinity is undoubtedly with *C. Lindleyanum*"; *Aphelandra Blanchetiana* (t. 7179), a showy acanthaceous plant and a native of Brazil; *Edgeworthia Gardnerii* (t. 7180), a native of the Himalayas, extending eastward into China and Japan, in which last country it is also extensively cultivated, as it furnishes a valuable